

**Reply Under 37 CFR 1.116  
Expedited Procedure  
Technology Center 3744**

Application No.: 10/541,803

Docket No.: 29171/39318A

**LISTING OF CLAIMS**

1. (Previously Presented) A unit element for a heat sink, comprising:
  - a series of inlet tubes having a range of diameters, the range of diameters including a maximum inlet tube diameter and a minimum inlet tube diameter;
  - a series of outlet tubes having a range of diameters, the range of outlet tube diameters including a maximum outlet tube diameter and a minimum outlet tube diameter;
  - a plurality of flow branch points, each having an incoming flow and a plurality of outgoing flows and each formed by the intersection of two or more of the inlet or outlet tubes;
  - at least one inlet tube having the minimum inlet tube diameter being in flow communication with at least one outlet tube having the minimum outlet tube diameter,
    - wherein each of the intersections is defined by an incoming flow, a first outgoing flow perpendicular to the incoming flow, and a second outgoing flow orthogonal to the first outgoing flow.
2. (Original) The unit element for a heat sink according to claim 1, wherein the inlet tubes and the outlet tubes are constructed using a plurality of layers of material, each layer having openings adapted to define the desired geometry of each tube.
3. (Original) The unit element for a heat sink according to claim 2, wherein the layers include layers made from a structural material and a sacrificial material.
4. (Original) The unit element for a heat sink according to claim 3, wherein the sacrificial material is etched to form the opening.

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5. (Original) The unit element for a heat sink according to claim 3, wherein the sacrificial material is fired to form the openings.

6. (Original) The unit element for a heat sink according to claim 3, wherein the structural material comprises silver.

7. (Canceled)

8. (Original) The unit element for a heat sink according to claim 3, wherein the sacrificial material comprises copper.

9. (Original) The unit element for a heat sink according to claim 3, wherein the sacrificial material comprises a polyimide material.

10. (Previously Presented) A heat sink comprising:  
a plurality of tubes in fluid communication with one another through a plurality of respective intersections, each intersection formed by an incoming tube and a plurality of outgoing tubes, each of the tubes having a radius that is essentially governed by the following relationship:

$$r_0^3 = r_1^3 + r_2^3 + r_3^3 + \dots + r_n^3$$

where  $r_0$  is the radius of the incoming tube, and  $r_1, r_2, \dots, r_n$  are the radii of the outgoing tubes,

wherein, for each of a plurality of intersections, a first outgoing tube is perpendicular to the incoming tube and a second outgoing tube is orthogonal to the first outgoing tube.

11. (Original) The heat sink according to claim 10, wherein the plurality of tubes are constructed using a plurality of layers of material, each layer having openings adapted to define the desired geometry of each tube.

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12. (Original) The heat sink according the claim 11, wherein the layers include layers made from a structural material and a sacrificial material.

13. (Original) The heat sink according to claim 12, wherein the sacrificial material is etched to form the openings.

14. (Original) The heat sink according to claim 12, wherein the sacrificial material is fired to form the openings.

15-24. (Canceled)